IMP. BUR.
16 MAY. 1914
ENTOM.

Miscellaneous Farm Bulletin.

I. VARIETY TEST OF COW PEAS.
II. GERMINATION TEST OF WHEAT.
III. A VARIETY TEST OF COTTON.
IV. SOME EXPERIMENTS WITH POTATOES.

ISSUED BY
THE NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION
RALEIGH, N. C.

BULLETIN NO. 146

DECEMBER 31, 1897

482

Publications will be sent to any address in North Carolina upon application.

NORTH CAROLINA COLLEGE OF AGRICULTURE AND MECHANIC ARTS,

RALEIGH, N. C.

THE NORTH CAROLINA

AGRICULTURAL EXPERIMENT STATION

BOARD OF TRUSTEES.

J. C. L. HARRIS, *President*, Raleigh.

L. C. EDWARDS.....Oxford.	J. J. BRITT.....Bakersville.
J. W. HARDEN, JR.....Raleigh.	ALEX. Q. HOLLADAY.....Raleigh.
H. G. CONNOR.....Wilson.	J. R. CHAMBERLAIN.....Raleigh.
MATT MOORE.....Warsaw.	S. L. CROWDER.....Halifax.
J. Z. WALLER.....Burlington.	.....
H. E. BONITZ.....Wilmington.	.....
B. F. DIXON.....King's Mountain.	.....

STATION COUNCIL.

ALEX. Q. HOLLADAY, LL. D., President of the College.

W. A. WITHERS, A. M.....Professor of Chemistry.
F. E. EMERY, M. S.....Professor of Agriculture.
W. F. MASSEY, C. E.....Professor of Horticulture.

EXPERIMENT STATION STAFF.

W. A. WITHERS., A. M, Acting Director.

W. A. WITHERS, A. M.....State Chemist.
F. E. EMERY, M. S.....Agriculturist.
W. F. MASSEY, C. E.....Horticulturist.
C. B. WILLIAMS, M. S.....Assistant Chemist.
H. K. MILLER, M. S.....Assistant Chemist.
C. D. HARRIS, B. S.....Assistant Chemist.
A. W. BLAIR, A. M.....Assistant Chemist.
J. D. HUFHAM, JR., A. B.....Assistant Chemist.
J. A. BIZZELL, B. S.....Assistant Chemist.
ALEX. RHODES (Southern Pines).....Assistant Horticulturist.
C. W. HYAMS.....Assistant Botanist.
J. M. JOHNSON, M. S.....Assistant Agriculturist.
F. E. HEGE.....Poultry Manager.
B. S. SKINNER.....Superintendent of Farm.
J. M. FIX.....Secretary.
H. E. KING.....Chief Clerk.
F. G. KELLY.....Clerk.
S. B. MOORE.....Clerk.
MISS M. S. BIRDSONG.....Stenographer.

The Director's office is in the main building of the College. Telephone No. 135 C. The street cars pass within one hundred yards of the College building.

The Station is glad to receive any inquiries on agricultural subjects. *Address all communications to the Agricultural Experiment Station, and not to individuals.* They will be referred to the members of the Station staff most competent to answer them.

MISCELLANEOUS FARM BULLETIN.

F. E. EMERY, AGRICULTURIST.

I. A SMALL VARIETY TEST OF COW PEAS.

A small plat of land was to be planted to the cow-pea in July, 1896, and a variety test was planned and put on it. The plat was comprised in one-sixth acre. The rows were put far enough apart to give 30 rows across the piece and six rows of each of four varieties were planted. Then two rows of common black peas and four rows of common clay peas were planted. The clay peas had been selected out as "dark" and "light" clay, but have been counted as clay, dropping the distinction for this trial. In working the adjoining plat, two-thirds of one row of clay peas was plowed out. These peas were planted July 3d after the ground was plowed on June 29.

On September 22d the following notes were taken as there seemed to be differences enough in the ripening of the peas to be indicated in this manner.

1. Queen of Carolina, nearly all ripe and leaves falling. Some leaves and fruit still green.

2. Foliage darker, *i. e.*, later than that of No. 1, but there are fewer green pods.

3. *Unknown* or Innominate. Color and degree of ripeness about as in No. 1.

4. *Clay Bank.* Still green; heaviest vines on the whole plat; very few, if any, fully ripe pods.

5. *Black Cow-pea.* All ripe and the foliage all has fallen.

6. *Clay Cow-pea.* Rather heavy vines with but few ripe pods. Foliage beginning to turn. The portion of clay pea plat planted as "dark" clay seemed a trifle more advanced than did the "light" clay portion.

YIELDS PER PLATS OF EQUAL AREAS.

No. of Plat.	NAME OF VARIETY.	Peas per Plat Corrected Yields. Pounds.	Pods and Chaff per Plat. (Not Revised).	Peas per Acre. Bushels.	Pods and Chaff per Acre. Pounds.
1	Queen of Carolina	20.8125	7.06	10.41	.....
2	Red Troy (Ripper)	38.75	13.63	19.38	.....
3	Unknown Pea, Innominate, Wood's Wonderful.	43.6875	12.375	21.84	.....
4	Clay Pea	19.25	2.94?	9.63	.....
5	Black Cow-pea	18.375*	12.94*	9.19	.....
6	Clay Cow-pea	32.775*	11.70*	16.39	.....

*Multiplied to raise yields to same areas as other plats.

The earliest ripening pea was No. 5 with Nos. 2, 1, and a few days later, and in this order.

No. 4 was the latest pea and No. 6 next latest.

No. 4 grows the heaviest vines, while No. 6 grew nearly as many.

No. 3 gave the heaviest yield of dry peas, with No. 2 a close second. The Clay pea 11.16 bushels per acre was but little more than half as prolific as was No. 3. Scarcely below the Clay was the Queen of Carolina 10.4 bushels per acre, and No. 4 Clay Bank with 9.63 bushels per acre, while the Black pea gave the lowest yield 9.19 bushels. The yield from this plat was doubtless materially reduced by some game chickens which paid their respects to it for several days. There being but two rows of these peas, only a few missing would materially affect the results.

II. TEST OF EFFECT OF CHEMICAL MANURE AND COTTON-SEED MEAL GERMINATION OF WHEAT.

At different times complaints have come to this Station that grain did not do well when drilled with certain manures and in many cases it was found that cotton-seed meal was used as the source of the nitrogen in the manures used. In some field tests with tobacco the experiments were practically ruined by something in the manure or in the manner and time of its application.

It is believed that the oily character of the meal interferes materially with the rising of water in the soil by capillarity, and that the injury done in the cases referred to above, resulted from the arrest of capillary moisture by the recent application of manure containing much cotton-seed meal.

A practical test on wheat was planned to find whether the meal alone would much affect the germination. A number of plats of three rows each were laid off and manured in drills opened by hand, the seed was then sown and covered, except in case of six plats, on which the manure was put on top of the covered rows. These six plats, 17 to 22, were duplicates, in every other respect, of plats 11 to 16. The plats 11, 12 and 13 were manured with a mixture of acid phosphate and kainit in equal parts by weight, in three rates of ½, 1 and 1½ pounds, and one pound of cotton-seed meal for each plat. Plats 14, 15 and 16 were manured with cotton-seed meal alone at the rate of one pound per plat. This was put under whilst as noted the duplicates were manured on the surface after the seed had been covered. The mineral manures put on these plats 11, 12, and 13 also 17, 18 and 19 were the same and applied in equal amounts with what was put on plats 8, 9 and 10 without cotton-seed meal. Plats 1 and 30 had no manure at all. Plats 2, 3 and 4 had acid phosphate alone, at the rates of ½, 1 and 1½ pounds. Plats 5, 6 and 7 had kainit alone at the same rates which were equivalent to 105, 210 and 315 pounds per acre.

Plats 23, 24 and 25 had the same amounts of mixed kainit and acid phosphate and six ounces each of sodium nitrate per plat. Plat 26 was given the same with more sodium nitrate, and plat 27 was given sodium nitrate alone, in the same amount as allowed for plat 26 or 131¼ pounds per acre. Plats 28 and 29 were duplicates respectively of plats Nos. 6 and 3.

After the planting which was all done in one day, November 28th, the weather was very favorable to those combinations which were thought to be unfavorable to the germination of the wheat. A soaking rain set in the next morning during which 1.92 inches of water fell and this was followed by a freeze and snow during the first few days of December. The melted snow amounted to 0.17 inch more water. The cool weather greatly retarded germination but wheat came up well during the latter part of December. The wheat appeared a little earlier and grew faster on plats 1, 2, 6, 7, 8, 9, 10, 11 and 17. On plats 3 and 4 at the time of making the notes the wheat was about half as tall as on those previously named, and about medium growth between these extremes, had been attained on plats 18 to 30 inclusive. On No. 12 the growth was slower, and on No. 13 and 14 slower yet, while on Nos. 15 and 16 the growth was about the same as on Nos. 13 and 14. A difference in appearance existed here all winter, there were fewer plants and these were of smaller growth than on other plats. Meadow larks probably took some young plants out of plat 1, and possibly plat 2, about this time. These plats bordered a grass plat and being near the buildings the birds did not venture out from cover far, or long enough to reach other plats, or to do much injury.

After vegetation was probably complete a count of the plants in each row should indicate in a general way whether there had been any retardation of germination and growth from the effect of the cotton-seed meal on the seed wheat. Raw weather with soil too wet to go on delayed and somewhat restricted the count to fewer plats than would otherwise have been counted.

The plants on the most important plats were counted January 23d by A. H. Oliver, B. S., then a senior student assisting in farm work.

	Plat 1.	*Plat 30.*	*Plat 14.*	*Plat 15.*	*Plat 16.*	*Plat 20.*	*Plat 21.*	*Plat 22.*
Row 1.....	1317.	1191.	787.	678.	704.	1229.	1206.	1150.
Row 2.....	1234.	1169.	876.	730.	625.	1153.	1119.	1119.
Row 3.....	1190.	1272.	666.	889.	611.	1185.	1101.	1045.
Per cent. of stand counting one plant for each seed sown.	59.4	57.7	37.0	36.5	30.8	56.6	54.4	52.6

There were two and one-fourth ounces of seed used in each row. A count of four lots weighed out gave an average of 2125 kernels of wheat exclusive of cracked and broken grains, so it may be just to assume 2100 kernels of sound wheat per row. From this num-

ber as a base the percentage of stand was calculated on the plats counted. All others appeared to differ so little in the number and growth that no count was attempted on other plats. If plats 1 and 30 represent normal germination and strength of plants up to the time of the count, the plats which had received cotton-seed meal on the surface can not be said to have deviated far enough to be noticed. There was on these plats a stand of 96.8, 92.9 and 90 per cent. respectively, of the average on plats 1 and 30, which differed by 3 per cent. in total stand of plants. The plats which received cotton-seed meal under the wheat suffered to a considerable extent. The stand was only 37, 36.5 and 30.8 per cent., or based on the average of plats 1 and 30, 62.3 and 52.6 per cent. of normal which seems to indicate an injurious effect from the cotton-seed meal.

A trial with cabbage and rape has been begun and others will follow to make sure whether the meal does harm or not with other families of plants, and if so, to point out a way to prevent it.

This is probably indicated by the growth on plats with cotton-seed meal spread on top of the soil. Broadcasting while preparing the seed-bed or ahead of the drill will perhaps be a preventive of loss from this cause.

III. A VARIETY TEST OF COTTON, 1893.

A variety test of cotton was made on a plat which had the previous season produced a heavy growth of sorghum. The five-eighths acre of land received eight two-horse loads of stable manure in March. This was plowed in and the land bedded up and opened and 2½ pounds per plat of acid phosphate was put in and the seed planted as given in table below. The acid Phosphate used was a little under 60 pounds per acre.

TABLE I.—SHOWS VARIETIES GROWN, SOURCE OF SEED, DATES OF PLANTING AND VEGETATION, STAND OF PLANTS AT HARVEST.

No. of Plat.	No. of Row.	NAME OF VARIETY.	Rows Planted.	Source of Seed.	Date of Planting, April 25th.	Date of First Vegetation.	No. of Plants at Harvest.
1	1 2	Afifi Egyptian.	2	U. S. D. of A.	April 25.	May 2.	535
2	3 4	Bamia.	2	"	"	"	599
3	5	The Allen.	1	"	"	"	213
4	6	Allen's Silk.	1	Capt. Ardery's Variety Test.	"	"	284
5	7 8	Alexander's Okra Leaf.	2	"	"	"	588
6	9 and 10 N-half 10	Geo. W. Truitt's Imp. " " "	1 ½ ½	A. D. & S. Co. Capt. Ardrey's Variety Test.	" "	" "	338
7	11 12	Jeff Welborn's Pet.	2	A. D. & S. Co,	"	"	289
8	13 14	Peerless.	2	Capt. Ardrey's Variety Test.	"	"	418
9	15 16	Peterkin (Pure).	2	Dr. Thomas' Variety Test.	"	May 4.	497
10	17 18	Shine's Early Prolific.	2	T. W. Wood & Son.	"	"	508
11	19 20	Tennessee Gold Dust.	2	Capt. Ardrey's Variety Test.	"	"	496
12	21 22	King's No. 1.	2	T. J. King.	"	"	549
13	23 24	King's No. 2.	2	T. J. King.	"	"	496
14	25 26	Matthew's Long Staple.	1–2 pcs	J.A.Matthews.	"	"	441

A count of the plants in each row was made, but no corrections have been made to perfect stand. It is preferred to make weights and averages on actual yields, because, where there were open spaces in rows caused by missing plants more sunshine and more room to branch out would give the varieties which presented the poorest stand an advantage which they would be given for no merit but rather thus gained, perhaps, from defective seed. The number of plants per plat at harvest time has been given above as last column in Table I. The greater room afforded for branching partly compensates for loss of stand. The figures of Table II are based on what was actually realized in harvest with no attempt to proportion to perfect stand.

TABLE II.—SHOWING WEIGHT OF SEED COTTON PICKED, WEIGHT GINNED, WITH LOSS IN PER CENT. FROM PICKING TO GINNING, AND WEIGHTS OF SEED AND LINT OBTAINED.

No. of Plat as in Table I.	Weight of Seed Cotton Picked. lbs.	ozs.	Weight of Seed Cotton Ginned. lbs.	ozs.	Per Cent. of Loss from Picking to Ginning.	Weight of Seed from Gin. lbs.	ozs.	Weight of Lint from Gin. lbs.	ozs.	Per Cent. of Seed.	Per Cent. of Lint.	Per Cent. of Motes, Sand, Waste, etc.	Pounds of Seed per acre. lbs.	ozs.	Pounds of Lint per acre. lbs.	ozs.
1	37	11	.....		?	16	9	8	4	66.75	33.25	?	376	4	187	5
2	35	9	33	4*	6.50	22	8	10	12	67.67	32.33	?	511	4	244	3
3	38	10	36	00	10.03	24	12	10	15	68.75	30.38	0.85	1125	0	497	1
4	49	8	41	12	15.67	28	8	14	11	68.56	31.44	0.30	1301	1	596	6
5	81	4½	71	1	12.57	46	14	23	4	65.96	32.72	1.32	1065	3	528	5
6	77	2	71	8	7.29	47	3	24	2½	66.00	33.79	0.22	1072	5	549	1
7	66	4	63	15	3.49	37	10	21	1	59.43	33.27	7.30	863	6	483	5
8	89	13	71	3	20.74	47	00	23	6	66.78	33.21	0.01	1080	4	537	3
9	82	13	76	9	7.53	49	1	26	14	64.08	35.10	0.82	1115	0	610	8
10	89	9	83	7	6.84	55	11	27	6	66.74	32.88	0.38	1265	6	623	5
11	83	8	79	8	4.79	54	2	24	15	68.08	31.37	0.55	1230	1	566	8
12	87	14	86	2	1.99	55	13	29	9	64.80	34.11	1.09	1268	4	667	7
13	91	3	84	3	7.64	55	6	28	6	65.78	33.70	0.52	1258	6	644	8
14	92	14	70	11	23.89	49	3	21	12	69.58	30.77	0.35	1239	0	547	9
Averages	.....		.....		9.92	.....		.....		66.35	32.81	1.14	1055	2	520	4

*Some mistake in weight and the of seed and lint obtained is used here.

Notes on growth June 9th.—The varieties on plats 1 and 2 were Egyptian cotton.

1. *Afifi.* Plants smallest and nearly dead where ground is wet.

2. *Bamia.* Growth vigorous as on any plat except at north end where water stands some after rain.

The Allen. Growth vigorous as on any plat at north end where water stands some after rain.

Allen's Silk. Growth vigorous as on any plat except at north end where water stands some after rain.

Alexander's Okra Leaf. Growth nearly as large as any variety.

Truitt's Improved. Stand poor; growth smaller than in Alexander's Okra Leaf.

Jeff. Welborn's Pet. Stand and growth not the best.*

Peerless. Stand and growth about medium.

Peterkin. Stand and growth about equal to the best.

Shine's Early Prolific. Stand and growth about equal to the best.

Tennessee Gold Dust. Stand and growth about equal to the best.

King's. No 1. Stand and growth equal to the best.

King's No. 2. Stand and growth equal to the best.

Matthew's Long Staple. Stand and growth equal to the best.

Cold weather has kept cotton rather poor and small.

July 4th. Saw first bloom to-day on Matthew's Long Staple. Have not hunted for more.

July 10th. In examining the cotton to-day it appears that most blooms are on the west side and from fallen blooms that King's Nos. 1 and 2, Matthews Long Staple, Alexander's Okra Leaf, Peterkin and Tennessee Gold Dust were first to bloom and in about this order.

This cannot be considered fully as an indication of earliness in the varieties named as the ground rises toward the west and shades from clay to sandy or gravely which was better drained and grew its crop faster when there was a plenty of rather cool water in the soil. On the east side there was far too much water around part of the plats 1, 2, and 3 on which Afifi, Bamia and Allen cottons were grown.

Calendar of Operations.—May 12th, cultivated cotton with Iron Age cultivator.

May 18th and 19th, chopped part of cotton and cultivated it 19th.

May 22d and 23rd, transplanted cotton to better stand and hoed it by hand. The transplanting consisted in moving out a spade full of earth where a plant was wanted and taking a like amount up with a plant in it where one was crowding and setting the latter in the hole made by first removal of soil. It is quickly and successfully done.

*The promoters of Limbless cotton claim in the advertisements (seen in the *Biblical Recorder* just as this is sent to press) that it is identical with this variety.

June 10th, plowed with sweep.
June 20th, plowed with sweep.
June 27th, thinned and scraped.
July 10th, split middles with cultivator.
July 11th, barred off with sweep.

Picked out Sept. 9th, Sept. 20th and 21st, Oct. 7th and 10th, Oct. 27th and 28th, Nov. 18th, and Dec. 20th and 21st.

Observations and Conclusions.—September 9th, first picking on 9 varieties. The three highest yields from first picking were: King's No. 1, 20 3/16 pounds; King's No. 2, 17 3/16 pounds; Tennessee Gold Dust, 10 5/16 pounds, which was nearly double the amount from all the other varieties combined.

The cotton was picked out very carefully, going over the plats six times, viz: September 9th, September 20th and 21st, October 10th and October 27th and 28th, November 18th, and December 20th and 21st.

These varieties have been grown together before with exception of those from U. S. Department of Agriculture and Mr. Matthews.* Notes taken when growing indicate there has been some mixing of seed, or of pollen. Probably mixed by bees and other insects.

July 26th, lightning scorched about one rod on both rows of Plats 8, 9, 10, and injured to a less extent, adjacent rows of Plats 7 and 11.

August 8th, very few bolls have been shed during recent wet weather and less from Egyptian varieties than from others. The area damaged by lightning is dying and will not make much, if any crop.

There were blooms on all the plats at the time of last picking, October 26th.

The highest per cent. of lint came from Peterkin, King's No. 1 and Shine's Early Prolific.

The highest yields of lint came from King's No. 1, King's No. 2, Shine's Early Prolific and Peterkin, with over 600 pounds of lint per acre.

The five varieties on plats 10 to 14 yielded very nearly like amounts of seed, the highest being 1268 and the lowest 1230 pounds per acre.

The average yield per acre was 520.4 pounds of lint and 1055.2 pounds of seed.

IV. SOME EXPERIMENTS WITH POTATOES.

1. *Deep vs. Shallow Culture.*—Potatoes were planted March 5, 1892, in the bottom of a furrow made by a one-mule plow run twice. Area used, one-twentieth acre. Ground leveled in covering four inches deep.

*Seed received from Jas. A. Matthews, Holly Springs, Miss.

Opposed to this, the same area was planted with identical amounts of seed and equally spaced, but planted on the surface and pressed down level, then covered with a hoe. The ground was left very uneven by digging to cover seed 2 to 3 inches deep.

The rows were 33 inches apart and seed placed two feet apart in the rows. Early Beauty of Hebron potatoes were used for seed.

The amount of seed used per acre was on an average 18 bushels. The method of seeding will be found under (3) as this was one of a combination experiment.

There were six rows of potatoes planted in each plat. The one-twentieth acre was comprised in 65 hills of the rows which were filled out at the lower end at the same rate of seeding. The same treatment was accorded this end as that given the whole plat, it was not planted until March 15th. When harvested row 3 showed a missing hill, and row 7 three missing hills, which were replaced by the same number taken at the end of the measured plat. The stand was complete in the other rows.

Spraying.—The Colorado Potato Beetle (Doryphora decemlineata) strongly attacked the potatoes. They were sprayed four times. The first time a shower washed the Paris Green off from the foliage. The second spraying was done as soon as the weather cleared and was very efficacious in removing beetles and larva. There were unhatched eggs, and some beetles which escaped. The third spraying nearly cleared up the second lot of larva, and a week later a fourth spraying was given for a few scattered lots left, the tops were in a very vigorous thrifty condition and were in strong contrast with some garden plats in the neighborhood which had not been sprayed and which were fairly stripped of foliage.

July 1st, tops all green and thrifty. The different amounts of seed are showing very plainly in the amount of tops. Some hills dug into show a *new growth* to be starting from the effect of recent wet weather. The potatoes were considered ready to dig on July 19th, but crates had not arrived to receive them and digging was deferred until the 24th.

When the tubers were dug it was found that the second growth, which had undoubtedly added very largely to the yield, had made a considerable portion of the crop unsalable because of the large number of prongs which had grown out on the first growth. The division of tubers was then made into merchantable ; merchantable size, but rough and small. The tubers were counted. The following table gives the number and weight of tubers of each class into which they were sorted by rows :

TABLE I.

PLAT 1.

No. of Row.	NO. OF TUBERS. Merchant'ble	Merchant'ble size but rough.	Small.	Total Number of Tubers.	Weight of Merchantable. lbs.	ozs.	Weight of Rough. lbs.	ozs.	Weight of Small. lbs.	ozs.	Total Weight of Tubers. lbs.	ozs.
1	335	151	800	1286	73	8	26	4	43	2	142	14
2	294	188	433	915	76	1	34	4	22	9	132	14
3	220	136	518	874	50	13	33	8	31	5	115	10
4	254	194	620	1068	54	7	43	8	34	4	132	3
5	297	149	583	1029	61	4	40	14	28	0	130	2
6	190	185	438	813	44	12	39	5	24	9	108	10
	1590	1003	3392	5985	360	13	217	11	183	13	762	5

PLAT 2.

7	164	232	644	1040	46	6	41	13	47	1	135	4
8	265	205	486	956	48	10	37	2	26	9	112	5
9	165	186	510	861	39	1½	33	13	22	2	95	½
10	269	192	625	1086	54	2	47	3	32	7	133	12
11	280	150	400	830	53	12	31	11	22	12	108	3
12	167	158	385	710	37	9	34	6	25	12	97	11
	1310	1123	3050	5483	279	8	225	6	176	11	671	9

The yields from these two twentieth-acre plats were derived from a perfect stand on each. The different rates of seeding were equal for these plats. Therefore the differences of yield may be regarded as due to the different mode of planting and culture, and the variable degrees of warmth and moisture to which these differences subjected the growing plants. Both lots suffered from the pronged growths, but the difference in this respect was in favor of the deep planting.

	lbs.	oz.	
Yield from deep planted and level culture plat....	762	5,	254.1 bushels per acre.
Yield from planted shallow and hilled plat.....	671	9,	223.9 bushels per acre.
Gain by deep level culture.....	90	12,	30.25 bushels per acre.

2. *Early vs. Late Planting.*—On March 31st an adjoining strip of land, which had been worked at the same time as the plats planted early, was planted with the same kind of seed and at the same rates of seeding per acre. The pieces of seed for each row were in all cases made as even in size as possible, so that every piece was almost an even aliquot part of the seed for the row.

The late-planted plat was given deep culture. This plat was held back in order to note the effect on growth due to late planting.

At first cultivation of this plat, before it had been vegetated, the cultivator was accidentally run over these rows and some of the seed dug up.

The cultivations were made light, and as often as any sign of crusting of the surface showed the need.

On May 10th the cultivator was run through the twelve rows planted early, and the first six rows for deep culture were hand hoed, but not "hilled." A single turn-plow was run, and the soil turned up to the rows, and hand-hoes smoothed up the work for shallow-planted plat.

Nothing was done at this time to the late-planted portion, where scarcely more than half of a stand of plants were left.

The unfortunate treatment of this plat nearly lost the whole value of it, but the number of hills planted and harvested were known, and the yields actually harvested are here raised in the proportion of the harvested to perfect stand of "hills" on the plat. The area was one-seventeenth acre planted in six rows, duplicating the method of planting, culture, and rate of seeding given to plat I.

TABLE II.

PLAT 3.

No. of Plat.	NO. OF TUBERS CALCULATED FROM THE HARVEST.				WEIGHTS CALCULATED FROM THE HARVEST.					
	Merchantable	Rough.	Small.	Total.	Merchantable Pounds.	Rough. Pounds.	Small. Pounds.	Total Weight. Pounds.	Plat Y'lds for Different rates of Seeding. Pounds.	Yields per Acre. Bushels.
13	163	182	.....	.....	28.93	42.47	36.81	108.21		
16	167	76	603	846	33.86	16.47	30.36	80.69	183.90	160.6
14	213	106	730	949	36.15	19.19	32.55	88.69		
17	109	142	727	978	17.57	31.94	41.19	90.70	179.39	152.5
15	78	160	667	895	16.19	24.57	35.19	75.95		
18	153	148	419	720	24.22	26.69	19.19	70.10	146.05	124.1
	883	814	3146	4852	156.92	161.33	195.29	514.34		145.7

The yields calculated out to acre areas show a striking decrease in yield from those of the plat planted earlier and grown by the same method of cultivation and treated in the same way, except not cultivated out of the ground one time.

Yield per acre for plat planted late..... 145.7 bushels per acre.
Yield per acre for plat planted early..... 254.1 bushels per acre.

Difference..... 108.4 bushels per acre.

The difference is mainly due to time of planting. Potatoes grow best in a moist, rather cool soil. Very early spring weather suits them here, and they should be planted as soon as danger of freezing passes in order to be nearly grown before the warm, dry weather, so pleasing to cotton growers, sets in.

The average weight of all the tubers on the late-planted plat was 1.69 ounces: merchantable, 2.81 ounces; rough, 3.17 ounces; and small, 0.806 ounce.

3. *Different Rates of Seeding.*—Seed was selected about equally from small and large tubers. These were divided to put sixty-five pieces weighing six, nine and twelve pounds in adjacent rows. Then these three were duplicated in the next three on each of the plats. The six pounds per row amounted to twelve bushels per acre; the nine pounds to eighteen bushels, and the twelve pounds per row to twenty-four bushels of seed per acre.

The rows 1 and 4, on plat 1, and 7 and 10, plat 2, and 13 and 16, plat 3, are the ones which received the heavier seeding. Rows 2 and 5, 8 and 11, and 14 and 17, are those which received the middle rate of eighteen bushels of seed per acre, while the remaining rows, 3–6, 9–12, and 15–18, received the lowest rate of seed, 12 bushels per acre.

The yields of tubers from each of the three plats may be shown as in the following table, calculated to acre proportions.

TABLE III.—Showing Yields Per Acre at Different Rates of Seeding.

	24 Bushels Seed per acre.	18 Bushels Seed per acre.	12 Bushels Seed per acre.
	y'ld in bu.	y'ld in bu.	y'ld in bu.
Plat 1: 2 Rows deep planted with level culture	275.		
2 " " " " " "		263.	
2 " " " " " "			224.25
Plat 2: 2 Rows surface planted with hill culture	269.		
2 " " " " " "		220.5	
2 " " " " " "			190.72
Plat 3: 2 Rows late deep planted with level culture	160.6		
2 " " " " " "		152.5	
2 " " " " " "			124.1

Reading this table left to right shows the effect of decreased amount of seed when the controlable conditions were all like, but the one of seed. Reading down the column the effect of shallow planting and hill culture, and also late planting, is seen. It may be reconstructed to show how many bushels might have been gained per acre by an addition of six bushels and twelve bushels of seed per acre from yields which appear in the last column.

TABLE IV.—SHOWING GAIN IN RATE OF YIELDS BY ADDITIONS TO SEED PLANTED.

	Gain in Yield from Addition of 12 Bu. Seed.	Gain in Yield from Addition of 6 Bu. Seed.
Plat 1. Planted early deep	50.75	38.75
Plat 2. Planted early and shallow	78.98	29.78
Plat 3. Planted late and deep	36.5	28.4

Of course one must understand that to produce a full crop of tubers, plant food must have been shipped in sufficient quantity, so there need be no lack of yield on account of no food material to produce a full crop. The greatest effect may then be expected from the fields which have been planted early, and the seed put in deep, if the soil has been frequently enough stirred to prevent exhausting the water supply by evaporation, and thereby holding down the temperature of the soil to degrees more favorable for the growth of the potatoes.